Andrey Grekov (Sep 21st)

Macdonald Polynomials with elliptic coefficients and analog of the Cherednik's operators for them

Recently, Peter Koroteev and Shamil Shakirov proposed a quantum version of the Double elliptic integrable system (final piece of the Calogero-Moser Ruijsenaars-Schneider many-body models family).

In the limit with trigonometric dependence on coordinates, its eigenfunctions are conjectured to be the version of the Macdonald Polynomials with coefficients elliptically depending on q and t. In this talk, I will present the generalization of the Sekiguchi-Debiard-Macdonald determinant for these functions. I will show, how it could be used to prove the formula for the Hamiltonians eigenvalues in this limit. Partial progress towards Cherednik's operators construction for this system also will be covered. Unfortunately, this progress was not enough to prove the commutativity of the Hamiltonians, however, it was still useful for the infinite number of particle limit construction, which turned out to be connected with a representation theory of elliptic quantum toroidal algebra.

Based on papers with Andrei Zotov: <https://arxiv.org/abs/2102.06853>, <https://arxiv.org/abs/2010.08077>